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Basics of advanced ultrasound wound and skin care: Technologies, devices, science and clinical outcomes

Purpose: Last 20 years ultrasound wound and skin treatment has been shown great interest in hospitals, clinics; wound care centers and doctors' offices. The purpose of this presentation is to share of my about 50 years scientific/academic, industry and clinical experience on research (*in vivo and in vitro*, laboratory, bench, etc.), review, and evaluate the safety, validity and efficacy of ultrasound treatment of all types of acute and chronic wounds including diabetic foot ulcers and share the results with the existing and future users by enhancing their understanding of potential positive outcomes from using the different Ultrasound devices in wound management.

Methods: For wound treatment purposes, the low and high frequency ultrasound devices have been used, which are been marketed worldwide. The ultrasonic parameters and design of instruments are very influential and critical for different aspects of wound treatment, such as ultrasonic energy delivery to target, tissue fractionation/ fragmentation/ debridement, liquefaction/ histotripsy, erosion, homogenization, liquation and wound therapy. Ultrasound treatment applies effective ways to prevent damage to surrounding healthy tissue and to succeed in therapeutic wound treatment. Treatment was both contact and non-contact modes, depending on the manufacturers, devices and wound conditions such as acute, infected, chronic, trauma, burn, gun shut, hard-to-heal, etc.

Results: All wounds have reacted well to ultrasound treatment; some of the wounds have exceeded expectations compared to standard-of-care treatment vectors. Even painful wounds

have been aggressively debrided with some devices without local anesthetics and without patient complaints. Granulation process had started within two (2) days.

Discussion/Conclusion: Ultrasound wound treatment device and method recommended for use in treatment of all types of wounds; depending on size, depth, infection, and other conditions, treatment time will vary. It kills the bacteria cells, increases blood flow in wound bed and periwound. Efficacy of the results correlates to numerous aspects of wave delivery and distribution of ultrasound energy to wound bed via multiple avenues of energy level, parameters, wave delivery concepts, e.g. contact and non-contact macro and micro-streaming.

Speaker Biography

Eliaz Babaev, Co-Founded Arobella Medical, LLC in 2006 and serves as its Chief Executive Officer and President. Dr. Babaev Co-founded Celleration Inc. and served as its Chief Technical Officer until July 2009 and Chief Executive Officer. Dr. Babaev worked as an ultrasound system design engineer and research scientist for DiaSorin, Inc., SpectRx, and AeroPag-USA, Inc. He served as the Head of Biomedical Engineering Laboratory and a Professor for State Technical University, Baku, USSR for 25 years. Dr. Babaev has more than 40+ years expertise in Non-Imaging Medical Ultrasound and particularly in Ultrasound Wound Management, live tissue repair and in all the areas of advances in skin, wound care, nursing, tissue science, drug delivery systems, wound treatment technologies, tissue engineering, and body architectonics research and cancer research including apoptosis. 50+ US and 100+ Worldwide Patents are issued, numerous are pending, 50+ scientific articles, abstracts are published.

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